

The opinion in support of the decision being entered today
is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BERNHARD ERICH HERMANN CLAUS and
JEFFREY WAYNE EBERHARD

Appeal 2007-1726
Application 09/976,621
Technology Center 2600

Decided: October 17, 2007

Before JOSEPH F. RUGGIERO, MAHSHID D. SAADAT, and
ST. JOHN COURTENAY III, *Administrative Patent Judges*.

COURTENAY, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-3, 13-16, 26-29, and 39. We have jurisdiction under 35 U.S.C. § 6(b). We AFFIRM.

THE INVENTION

The disclosed invention relates generally to tomosynthesis, and more particularly, to a method and apparatus for performing a reconstruction algorithm (Specification 1).

Independent claim 1 is illustrative:

1. A method for reconstructing a three-dimensional dataset representative of an imaged object, said method comprising:

acquiring views of an object from at least two projection angles with an imaging system including at least one radiation source and at least one detector array to generate a projection dataset of the object;

backprojecting the views across an imaged volume to generate backprojected data; and

processing the backprojected data using a non-linear operator to generate a three-dimensional dataset consisting of a plurality of images representative of the imaged object.

THE REFERENCES

Webber	US 6,081,577	June 27, 2000
Stanton	US 6,744,848 B2	June 1, 2004

The Examiner relies upon the following U.S. patent reference as extrinsic evidence in support of the rejections:

Kirchner ¹	US 6,028,910	Feb. 22, 2000
-----------------------	--------------	---------------

¹ See Kirchner, col. 9, ll. 9-49, Fig. 5b.

THE REJECTIONS

Claims 1-3, 13-16, and 26 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Webber.

Claims 27-29 and 39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Webber in view of Stanton.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the Briefs and the Answer for the respective details thereof.

ISSUES

We decide the following issues we have determined are dispositive in this appeal:

Whether Webber discloses “processing the backprojected data using a non-linear operator,” as recited in each independent claim. More particularly, we broadly but reasonably construe the claim term “backprojected” in a manner consistent with the Specification and decide whether the term as used in each independent claim “reads on” the Webber reference relied on by the Examiner.

STATEMENT OF LAW

In rejecting claims under 35 U.S.C. § 102, a single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation. *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1375-76 (Fed. Cir. 2005) (citation omitted). “Anticipation of a patent claim requires a finding that the claim at issue ‘reads on’ a prior art reference.” *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1346 (Fed Cir.

1999) (“In other words, if granting patent protection on the disputed claim would allow the patentee to exclude the public from practicing the prior art, then that claim is anticipated, regardless of whether it also covers subject matter not in the prior art.”) (citations omitted).

ANALYSIS

Claims 1-3, 13-16, and 26

We consider the Examiner’s rejection of claims 1-3, 13-16, and 26 as being anticipated by Webber. Since Appellants’ arguments with respect to this rejection have treated these claims as a single group which stand or fall together, we will select independent claim 1 as the representative claim for this rejection. *See* 37 C.F.R. § 41.37(c)(1)(vii)(2004).

Appellants note that all the claims require the backprojected data to be processed using a non-linear operator. Appellants state that Webber discloses using a non-linear operator but never in combination with a backprojection operation. Appellants contend that Webber discloses using either backprojection (linear tomosynthesis) or minimization (non-linear tomosynthesis), but not both (Br. 9).

Appellants further argue there is no teaching or suggestion that the backprojected data (of Webber) are being further processed via a non-linear operator as claimed in the present application (Br. 10). Appellants contend Webber teaches that one skilled in the art may not need a backprojection technique at all and may just rely on the non-linear combination of the projection images to generate a tomosynthesis image for diagnosis (*id.*). Specifically, Appellants note that Webber states at column 28:

[t]his approach is very efficient: it is simpler to implement than conventional tomosynthetic back-projection methods; and it produces sharp-appearing images that do not require additional computationally intensive inverse filtering or iterative deconvolution schemes.
(Webber, col. 28, ll. 20-24).

The Examiner disagrees. The Examiner, as finder of fact, contends that Webber discloses processing backprojected data using a non-linear operator in Fig. 24B (Answer 11-12). The Examiner attempts to clarify the meaning of “backprojection” by pointing to the use of the term in an extrinsic reference (*See* Kirchner, col. 9, ll. 9-49, Fig. 5b). The Examiner finds the extrinsic Kirchner reference discloses that backprojected data at four views are superimposed to form a final dataset as shown at the bottom of Fig. 5c (Answer 12; *see* Kirchner, Fig. 5c). From this extrinsic use of the term, the Examiner concludes that “[e]vidently, the data are backprojected first and [then an] operation such as superposition is performed.” (*id.*). Regarding the Webber reference relied on in the rejection, the Examiner finds Webber discloses at column 23, lines 25-31 that “[a]t step 904, the projected images are shifted laterally, in the plane of projection, by amounts required to produce a desired tomosynthetic slice where all the images are then superimposed” The Examiner finds this occurs (in Webber) in a manner identical to the method described in Appellants’ disclosure at Fig. 2 (*id.*).

In the Reply Brief, Appellants counter that the term “backprojection” is clearly understood in the art. Appellants state that “‘backprojection’ as used in Webber is the same as ‘backprojection’ as used in the present

application.” (Reply Br. 2, ¶2). In spite of having an opportunity to respond in the Reply Brief to the Examiner’s reliance upon extrinsic evidence in construing the claim terms “backprojecting” and “backprojected,” Appellants nevertheless contend they have not been given a fair opportunity to respond to any statement that Kirchner may or may not make (*id.*).

Claim Construction

We begin our analysis by broadly but reasonably construing the scope of the claim terms “backprojecting” and “backprojected” in a manner fully consistent with the Specification. Claims are given their broadest reasonable construction “in light of the specification as it would be interpreted by one of ordinary skill in the art.” *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

With respect to the Examiner’s reliance upon the Kirchner patent as extrinsic evidence in construing the claims, we note that our reviewing court has determined that extrinsic evidence is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1319 (Fed. Cir. 2005) (en banc). The court in *Phillips* reaffirmed its view that the specification “is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Id.* at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

When we look to Appellants’ Specification for *context*, we find backprojection is discussed on page 1, as follows:

[0003] One known method of reconstructing a three-dimensional dataset representative of the imaged object is known in the art as simple backprojection, or shift-and-add. Simple backprojection backprojects each view across the imaged volume, and averages the backprojected views. A "slice" of the reconstructed dataset includes the average of the backprojected images for some considered height above the detector. Each slice is representative of the structures of the imaged object at the considered height, and the collection of these slices for different heights, constitutes a three-dimensional dataset representative of the imaged object.
(Specification, ¶0003).

While the Specification clearly discloses that "[s]imple backprojection backprojects each view across the imaged volume, and averages the backprojected views," we note that "*simple* backprojection" is not claimed (Specification, ¶0003). In contrast, each independent claim before us broadly recites "processing the backprojected data using a non-linear operator" (independent claims 1, 13, 14, 26, 27, and 39). Moreover, in the Reply Brief, Appellants have stated that the term "backprojection" is clearly understood in the art and, further, that "'backprojection' as used in Webber is the same as 'backprojection' as used in the present application." (See Reply Br. 2, ¶2).

In particular, we note that the paragraph describing (simple) "backprojection" on page 1 of Appellants' Specification is found under the heading "BACKGROUND OF THE INVENTION" (Specification 1, ¶0003). Thus, we find Appellants have given no special definition to the claim term "backprojection" that differs from the meaning it would otherwise possess. See *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Cf. Phillips, 415 F.3d at 1316 (“[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.”).

After carefully examining the evidence before us, we find that Webber discloses two tomosynthesis techniques (as shown in Figs. 24A and 24B) that differ only in the type of operator (linear or non-linear) applied to the two distinct data images of radiopaque objects 1140 and 1142. Fig. 24A of Webber is clearly labeled as “Linear Tomosynthesis (Backprojection)” and Fig. 24B is clearly labeled as “Nonlinear Tomosynthesis (Minimization).” We note that minimization is a type of non-linear operator, as expressly disclosed by Webber at column 22, lines 37-40, and also consistent with Appellants’ Specification at pages 6-7, paragraph 0018.

Appellants assert that Fig. 24B of Webber does not disclose “backprojection” even though the only difference we find between Figs. 24A and 24B is the type of operator applied to the two distinct data images. Thus, Appellants’ arguments impute that “backprojection” depends upon the type of operator applied. After carefully reviewing the record before us, we find this interpretation inconsistent with “backprojection” as disclosed in Appellants’ own Specification.

In particular, we find Fig. 2 of Appellants’ Specification expressly discloses the discrete ordered steps of: “Backprojecting the projection data across an imaged volume,” (step 63), followed by, “Processing the backprojected data using a non-linear operator to generate a plurality of medical images representative of the imaged object” (step 66). Thus, it is

clear, as disclosed in Appellants' own Specification, that backprojection occurs (i.e., in step 64), *before the step of processing with an operator* (i.e., Step 66). *See also* Appellants' Specification at paragraph 16:

[0016] FIG. 2 is a flow diagram of a method 60 including acquiring views 62 of an object 12, such as a breast 12, from at least two projection angles with medical imaging system 10 (shown in FIG. 1), such as a tomosynthesis imaging system and a CT imaging system, to generate a projection dataset of object 12. Imaging system 10 includes at least one radiation source 14 and at least one detector array 16. *The views are backprojected 64 across an imaged volume by image reconstructor 36. The backprojected data is processed 66 using a non-linear operator 68 and further processed by image reconstructor 36 to generate a plurality of slices, representative of the imaged object, that are stored by computer 38 in storage device 40 for viewing on display 44 [emphasis added].*
(Specification, ¶0016).

See also Appellants' Brief at page 10:

In contrast, the claimed processing uses a backprojection technique on the acquired projection images to generate backprojected data. The backprojected data is further processed via a non-linear operator to generate a three-dimensional dataset representative of the imaged object.
(Br. 10).

Because the only difference we find between Figs. 24A and 24B of Webber is the type of operator applied to the two distinct data images, we find the weight of the evidence supports the Examiner's position. Thus, we find the recited language of "processing the *backprojected* data using a non-linear operator" reads on Webber at Fig. 24B (*See also* instant claim 1).

We likewise find Appellants' second argument unavailing, that "Webber teaches that one skilled in the art may not need a backprojection technique at all and may just rely on the non-linear combination of the projection images to generate a tomosynthesis image for diagnosis." (Br. 10). We note that Webber's disclosure at column 28, lines 14-31 does not refer directly to the figures relied on by the Examiner (*See* Webber, Figs. 24A and 24B). Moreover, we find Webber's disclosure at column 28, lines 14-31, is directed to conventional tomosynthetic backprojection methods that rely on linear operators, e.g., linear summation (*See* Webber, col. 27, ll. 64-66). In particular, we find Webber's disclosure at column 28, lines 14-31, has no specific nexus to Fig. 24B and thus does not preclude alternate forms of backprojection, such as backprojection using a non-linear minimization operator, as shown in Fig. 24B. To the extent Appellants are arguing that Webber's disclosure at column 28, lines 14-31 "teaches away" from the claimed invention, we note our reviewing court has found "[t]eaching away is irrelevant to anticipation." *Seachange International, Inc., v. C-Cor, Inc.*, 413 F.3d 1361, 1380 (Fed. Cir. 2005) (citations omitted). Therefore, we find Appellants' "teaching away" argument misplaced because the Examiner has rejected the claims under 35 U.S.C. § 102.

Based on the findings of facts and analysis above, we conclude that Appellants have failed to show the Examiner erred in rejecting representative claim 1 as being anticipated by Webber.

Pursuant to 37 C.F.R. § 41.37(c)(1)(vii), we have decided the appeal with respect to claims 2-3, 13-16, and 26 in this group on the basis of the

selected claim alone (independent claim 1). Therefore, we sustain the Examiner's rejection claims 1-3, 13-16, and 26 as being anticipated by Webber.

Claims 27-29, and 39

We consider next the Examiner's rejection of claims 27-29 and 39 as being unpatentable over Webber in view of Stanton.

Appellants argue that claims 27-29 and 39 are improperly rejected for the same reasons that independent claims 1, 13, 14, and 26 are allegedly improperly rejected (Br. 13). Specifically, Appellants argue that the combination of Webber and Stanton does not teach or suggest backprojecting data that is processed using a non-linear operator (*id.*).

In response, we have found *supra* that Webber discloses backprojecting data that is processed using a non-linear operator. Accordingly, we sustain the Examiner's rejection of claims 27-29 and 39 as being unpatentable over Webber in view of Stanton for the same reasons discussed *supra* with respect to independent claim 1.

DECISION

Based on the findings of facts and analysis above, we conclude that the Examiner did not err in rejecting claims 1-3, 13-16, 26-29, and 39. Therefore, the decision of the Examiner rejecting claims 1-3, 13-16, 26-29, and 39 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

Appeal 2007-1726
Application 09/976,621

AFFIRMED

eld

GENERAL ELECTRIC COMPANY (PCPI)
C/O FLETCHER YODER
P. O. BOX 692289
HOUSTON TX 77269-2289